a first impeller disposed in said first nozzle casing for guiding said handled liquid to said passage around said motor stator;

second fixing portions provided at an opposite axial end of said motor and angularly spaced at a predetermined angle;

a second nozzle casing mounted on said second fixing portions and having a second nozzle directed perpendicular to the axial direction of said motor; and

a second impeller disposed in the second nozzle casing for guiding said handled liquid from said passage around said motor stator, said first impeller and said second impeller having respective inlet ports directed opposite to each other.

REMARKS

Favorable reconsideration of this application, in view of the above amendments and in light of the following remarks and discussion, is respectfully requested.

Claims 1-23 are currently pending in the application; Claims 1, 5, 6, 10, 11, 15, 16, and 19-22 having been amended by way of the present response.

In the outstanding Office Action, the drawings were objected to under 37 C.F.R. § 1.84(h)(5) because each of Figures 1 and 4 show modified forms of constructions. In response, as shown in the concurrently filed Letter Requesting Approval of Drawing Changes, Applicants have amended Figures 1 and 4 in red as Figures 1A and 4A to show examples of an impeller 18 and impellers 75 and 76 that are cast, respectively. As further shown in the Letter Requesting Approval of Drawing Changes, Applicants have added new Figures 1B and 4B to show examples of the impeller 18 and the impellers 75 and 76 that are pressed and welded, respectively. Thus, for at least these reasons, Applicants respectfully request that the objection to the drawings be withdrawn.

Applicants have also amended the specification to refer to Figures 1A, 1B, 4A, and 4B, as appropriate, in view of the above changes to the drawings.

In the Office Action, the disclosure was objected to because of an informality. Specifically, the reference to the publication "Turbomachinery" was regarded as an improper reference. In response, Applicants have amended the specification to include details regarding the publisher and how to locate the publication, as requested by the Examiner. In particular, Applicants have amended the specification to state "Kazunari Matsumoto, Junichi Kurokawa, Jun Matsui, and Hiroshi Imamura, *Performance and Effect of Parameters on Very Low Specific Speed Pump*, TURBOMACHINERY, Dec. 1999, Vol. 27, No. 12, pp. 43-51." Thus, for at least these reasons, Applicants respectfully request that he objection to the specification be withdrawn.

The Office Action asserted that the title of the invention is not descriptive, and required a title indicative of an invention to which claims are directed. In response, Applicants have amended the title to "CANNED MOTOR AND PUMP ASSEMBLY" in accordance with the Examiner's helpful suggestion.

In the Office Action, Claims 5-9 and 17-20 were rejected to under 37 C.F.R. § 1.75(C) as being in improper form because a multiple dependent claim cannot depend from a multiple dependent claim. In response, Applicants have amended the dependencies of Claims 5, 6, 15, 16, 19 and 20 to overcome the rejection, such that no multiple dependent claim depends from another multiple dependent claim. Thus, for at least these reasons, Applicants respectfully request that the objection to Claims 5-9 and 17-20 under 37 C.F.R. § 1.75(C) be withdrawn.

In the Office Action, Claims 1-23 were rejected under 35 U.S.C. § 112, second paragraph.[1] Regarding Claims 1-20, the Office Action asserts that the claims set forth an apparatus preamble followed with method steps, and therefore the claims are indefinite. In response, Applicants respectfully assert that the recitation of "formed" in the claims in understood to refer to structural arrangements of motor frames, and not to methods of producing the motor frames. Therefore, Applicants respectfully assert that the claims are understood to recite features of apparatuses. Notwithstanding this assertion, however, Applicants have amended independent Claims 1, 10, and 11 in a non-narrowing manner to recite "wherein . . . are integrally formed," "wherein . . . is formed," and "being formed" in place of previous recitations of "are . . . integrally formed," "is formed," and "are formed," respectively, to further prosecution of the application, and not for any reasons related to the patentability of the claims in view of the references of record in the application.

Regarding Claims 15 and 16, Applicants have rewritten the claims in independent form to remove the recitation of "non-austenitic cast stainless steel," such that the claims do not state broader ranges of features together with narrower ranges of features that fall within the broader ranges of features.

Regarding Claims 21 and 22, Applicants have amended the claims to remove the recitations of "an axial end of said motor frame at a variable angle" and "an opposite axial end of said motor frame at a variable angle," and to recite structural elements. Thus, for the reasons discussed in detail above, Applicants respectfully request that the rejection of Claims 1-23 under 35 U.S.C. § 112 be withdrawn.

In the Office Action, Claims 1, 2, and 10-16 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,674,056 to Yamamoto et al. (hereafter

[1] Although the Office Action states on page 3, lines 21-23, that "Claims 1-14 are rejected under 35 U.S.C. 112," the subsequent portions of the Office Action set forth reasons for rejections that appear to apply to each of

Yamamoto). Claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto in view of Japanese Publication No. 10-080093 to Norihei. Claim 4 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto in view of U.S. Patent No. 5,401,146 to Moriya et al. (hereafter Moriya). Claim 4 was also rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto in view of Norihei, in further view of Moriya.[2] Claims 21-23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,022,739 to Herrick et al. (hereafter Herrick). Applicants respectfully assert that the claims are allowable over the references of record for at least the reasons discussed in detail below.

The present invention is directed to motor frames and motor pumps. Independent Claim 1 recites a first cylinder housing a motor stator and a second cylinder disposed around the first cylinder integrally formed of one metal material. Each of independent Claims 10 and 11 recites a motor frame formed of non-austenitic cast stainless steel. Newly independent Claims 15 and 16 recite motor frames formed of a specified martensitic stainless steel and a specified ferritic stainless steel, respectively. Each of independent Claims 21 and 22 recite a nozzle directed perpendicular to an axial direction of a motor frame. Examples of advantages of such frames and pumps are discussed throughout the specification.

Regarding the rejection of independent Claim 1, Yamamoto is directed to a motor pump assembly. As shown in Figure 1, for example, of Yamamoto, a motor pump assembly includes a canned motor 6 having an outer motor frame barrel 14 is housed and fixed in a pump casing 1 having an outer cylinder 2.[3] Because the outer cylinder 2 is separate from other components of the motor pump assembly, a pressed sheet of stainless steel that permits

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currently pending Claims 1-23.

[2] Applicants respectfully assert that this rejection seems to have been included in error, as Office Action does not discuss features allegedly taught or suggested by Norihei.

[3] Column 2, lines 60-61, and lines 63-64; Column 3, lines 30-32; and Column 4, lines 15-27.

a heat transfer from an outer surface of the pump assembly to a fluid in the pump to be carried out efficiently can be used as the outer cylinder 2, thereby achieving an aspect of the invention.[4]

However, Applicants respectfully assert, and the Office Action explicitly concedes,[5] that Yamamoto does not teach the claimed features of a first and a second cylinder integrally formed of one metal material, as recited in independent Claim 1. Specifically, independent Claim 1 recites "wherein said first cylinder . . . [and] said second cylinder . . . are integrally formed of one metal material."

The Office Action seems to assert that it would have been obvious to make portions of the motor pump assembly disclosed by Yamamoto integrally "to have advantageously facilitated manufacturing of the pump."[6] Applicants respectfully traverse the assertion for the following reasons.

As stated in MPEP § 2143.01, "[i]f proposed modification would render the prior art invention unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." (Underlining added). MPEP § 2143.01 further advises the Examiner that "[i]f the proposed modification or combination would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious." (Underlining added). In this case, the proposed modification of integrally forming the outer motor frame barrel 14 and the outer cylinder 2 would render Yamamoto unsatisfactory for its intended purpose of providing the outer cylinder 2 separate from other components of the motor pump assembly such that a pressed sheet of stainless steel that permits a heat transfer from an outer surface of the pump assembly to a fluid in the pump to be carried out efficiently can be used. Further, the

[4] Column 2, lines 1-6, and from Column 4, line 64 to Column 5, line 2.
[5] Page 5, lines 17-18, of the outstanding Office Action.

proposed modification would change the principle of operation of Yamamoto by preventing the specified heat transfer from an outer surface of the pump assembly to a fluid in the pump to be carried out efficiently by such an outer cylinder 2. In view of the above discussion, Applicants respectfully request that the rejection of independent Claim 1 under 35 U.S.C. § 103(a) be withdrawn, and the independent claim allowed.

Regarding the rejection of independent Claims 10 and 11, as discussed above, Applicants respectfully assert that the claims are directed to structural arrangements of the motor frames, and not to products produced by a specified process, because the claims recite structural features of the motor frames, and do not recite any specified manufacturing processes for the motor frames. Inasmuch as Applicants are required to provide evidence of advantages of such motor frames, Applicants respectfully assert that motor frames so-constructed provide greater heat conductivity and a smaller thermal expansion coefficient.[7]

Thus, in response to the rejection, Applicants respectfully assert, and the Office Action explicitly concedes,[8] that Yamamoto does not teach or suggest the claimed features of a motor frame formed of non-austenitic cast stainless steel, as recited in independent Claims 10 and 11. Specifically, independent Claim 10 recites "wherein the motor frame is formed of non-austenitic cast stainless steel." Independent Claim 11 recites "said first cylinder and said second cylinder [of a motor frame] being formed of non-austenitic cast stainless steel." Thus, for at least these reasons, Applicants respectfully request that the rejection of independent Claims 10 and 11 under 35 U.S.C. § 103(a) be withdrawn and the independent claims allowed.

Regarding the rejection of newly independent Claims 15 and 16, for reasons similar to those discussed above, Applicants respectfully assert that the claims are directed to structural

[6] Page 5, lines 20-23, of the outstanding Office Action.
[7] Please see, for example, page 12, lines 2-7, of the originally filed disclosure.

arrangements of the motor frames, and not to products produced by a specified process, because the claims recite structural features of the motor frames, and do not recite any specified manufacturing processes for the motor frames. Inasmuch as Applicants are required to provide evidence of advantages of such motor frames, Applicants respectfully assert that motor frames so-constructed have higher strength and corrosion resistance, and improved welding properties.[9]

Thus, in response to the rejection, Applicants respectfully assert, and the Office Action explicitly concedes,[10] that Yamamoto does not teach or suggest the claimed features of a motor frame formed of a specified martensitic stainless steel or a specified ferritic stainless steel, as recited in newly independent Claims 15 and 16, respectively. Specifically, newly independent Claim 15 recites "wherein said motor frame is formed of martensitic stainless steel containing 15 – 17 % of chromium." Newly independent Claim 16 recites "wherein said motor frame is formed of ferritic stainless steel containing 20 – 30 % of chromium." Thus, for at least these reasons, Applicants respectfully request that the rejection of newly independent Claims 15 and 16 under 35 U.S.C. § 103(a) be withdrawn and the independent claims allowed.

Regarding the rejection of independent Claims 21 and 22, Herrick is directed to a motor and pump apparatus. As shown in the figure, for example, of Herrick, a cover wall 92 is formed to provide a central outwardly flaring pump suction inlet opening 94.[11]

However, because the inlet opening 94 is not perpendicular to an axial direction of a motor frame, for example, in Herrick, Applicants respectfully assert that Herrick does not teach or suggest the claimed features of a nozzle directed perpendicular to an axial direction

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[8] Page 7, lines 18-19, of the outstanding Office Action.
[9] Please see, for example, from page 18, line 22 to page 19, line 8, of the originally filed disclosure.
[10] Page 9, lines 9-11, of the outstanding Office Action.
[11] Column 3, lines 40-43.

of a motor frame, as recited in independent Claims 21 and 22. Specifically, each of independent Claims 21 and 22 recites "a second nozzle directed perpendicular to the axial direction of said motor frame." Thus, for at least these reasons, Applicants respectfully request that the rejection of independent Claims 21 and 22 under 35 U.S.C. § 103(a) be withdrawn and the independent claims allowed.

Dependent Claims 2-9, 12-14, 17-20, and 23 depend from independent Claims 1, 10, 11, 15, 16, 21, and 22, and are therefore also allowable for at least the same reasons as the independent claims, as well as for their own features. Thus, for at least these reasons, Applicants respectfully request that the rejections of dependent Claims 2-9, 12-14, 17-20, and 23 under 35 U.S.C. § 103(a) be withdrawn and the dependent claims allowed.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 1-23 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact the undersigned representative at the below listed telephone number.

Finally, the attention of the Patent Office is directed to the change of address of Applicants' representative, effective January 6, 2003:

Oblon, Spivak, McClelland, Maier & Neustadt, P.C.

1940 Duke Street

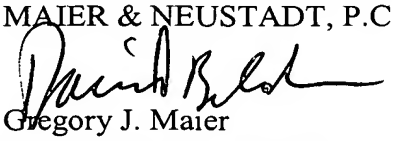
Alexandria, VA 22314.

Please direct all future communications to this new address.

Respectfully submitted,

22850

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



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Marked-Up Copy
Serial No: 10/069,602
Amendment Filed on: February 19, 2003

IN THE SPECIFICATION

Page 15, beginning with line 27, please delete the paragraph and replace with the following text:

--[FIG. 1 is a] FIGS. 1A and 1B are vertical cross-sectional [view] views showing [a] full-circumferential-flow in-line [pump] pumps as [an example] examples of [a] motor [pump] pumps according to a first embodiment of the present invention;--

Page 16, beginning with line 3, please delete the paragraph and replace with the following text:

--FIG. 2 is a cross-sectional view taken along a line II - II in FIG. [1] 1A;--

Page 16, beginning with line 5, please delete the paragraph and replace with the following text:

--FIG. 3 is a view as viewed in the direction of the arrow III in FIG. [1] 1A;--

Page 16, beginning with line 7, please delete the paragraph and replace with the following text:

--[FIG. 4 is a] FIGS. 4A and 4B are vertical cross-sectional [view] views showing [a] multistage motor [pump] pumps according to a second embodiment of the present invention; and--

Page 16, beginning with line 10, please delete the paragraph and replace with the following text:

--FIGS. 5A through 5C are views showing variations of the layout of inlet and outlet pump casings of the multistage motor pump shown in FIG. 4, and FIG. 5A is a view showing the directions of inlet and outlet nozzles shown in FIG. [4] 4A, and FIGS. 5B and 5C are views showing the directions of inlet and outlet nozzles in other embodiments.--

Page 16,beginning with line 18, please delete the paragraph and replace with the following text:

--A first embodiment of the present invention will be described in detail below with reference to the drawings. The first embodiment will be described below with reference to FIGS. [1 through] 1A, 1B, 2 and 3.--

Page 16, beginning with line 22, please delete the paragraph and replace with the following text:

--[FIG. 1 is a] FIGS. 1A and 1B are vertical cross-sectional [view] views showing [a] full-circumferential-flow in-line [pump] pumps as [an] example of [a] motor [pump] pumps according to the present embodiment, FIG. 2 is a cross-sectional view taken along a line II-II in FIG. [1] 1A, and FIG. 3 is a view as viewed in the direction of the arrow III in FIG. [1] 1A.--

Page 19,beginning with line 9, please delete the paragraph and replace with the following text:

--The main shaft 14 is supported at its opposite ends by bearings (described later on) provided in the motor frame 4, and an impeller 18 is fixed to one of the ends of the main shaft 14. The impeller 18 is cast of non-austenitic cast stainless steel or pressed and welded of thin austenitic stainless steel. In FIG. [1] 1A, the impeller 18 [is shown as having an upper half which] is cast of non-austenitic cast stainless steel. In FIG. 1B, the impeller 18 [and a lower half which] is pressed and welded of thin austenitic stainless steel.--

Page 25,beginning with line 27, please delete the paragraph and replace with the following text:

--A second embodiment of the present invention will be described in detail below with reference to [FIG. 4] FIGS. 4A and 4B.--

Page 26, beginning with line 1, please delete the paragraph and replace with the following text:

--[FIG. 4 is a] FIGS. 4A and 4B are vertical cross-sectional [view] views showing [a] multistage motor [pump] pumps according to the second embodiment.--

Page 26, beginning with line 3, please delete the paragraph and replace with the following text:

--As shown in [FIG. 4] FIGS. 4A and 4B, a multistage motor pump according to the second embodiment is basically made up of an inlet nozzle casing 61, a motor frame 62, an outlet nozzle casing 63, a casing cover 64, and a canned motor 65. In the present embodiment, the inlet nozzle casing 61 serves as a first nozzle casing and the outlet nozzle casing 63 as a second nozzle casing. However, the outlet nozzle casing may serve as the first nozzle casing, and the inlet nozzle casing may serve as the second nozzle casing.--

Page 27, beginning with line 9, please delete the paragraph and replace with the following text:

--The impellers 75, 76 are either cast of non-austenitic cast stainless steel or pressed and welded of thin austenitic stainless steel, and produce a high pump head (pressure) up to 100 m per stage. In FIG. [4] 4A, each of the impellers 75, 76 [is shown as having a right half which] is cast of non-austenitic cast stainless steel. In FIGS. 4B, each of the impellers 75, 76 [and a left half which] is pressed and welded of thin austenitic stainless steel.--

Page 27, beginning with line 21, please delete the paragraph and replace with the following text:

--A radial bearing 81 is mounted on a bearing bracket 80. In [FIG. 4] FIGS. 4A and 4B, the reference numeral 82 denotes a sleeve which makes up a sliding assembly in cooperation with the radial bearing 81, and the sleeve 82 is held in abutment against a washer 83. The bearing bracket 80 is held in abutment against the end of the first cylinder 66.--

Page 28,beginning with line 1, please delete the paragraph and replace with the following text:

--A radial bearing 91 and a fixed thrust bearing 92 are mounted on a bearing bracket 90. The radial bearing 91 has an end face functioning as a fixed thrust sliding member, and a rotatable thrust bearing 94 held by a thrust disk 93 is held in sliding contact with the end face of the radial bearing 91. A rotatable thrust bearing 95 serving as a rotatable thrust sliding member is disposed in confronting relation to the fixed thrust bearing 92. In [FIG. 4] FIGS. 4A and 4B, the reference numeral 97 denotes a sleeve which makes up a sliding assembly in cooperation with the radial bearing 91.--

Page 31, beginning with line 4, please delete the paragraph and replace with the following text:

--With this arrangement, the directions of the inlet nozzle 110 and the outlet nozzle 120 of the nozzle casings can be changed angularly at 90°. FIG. 5A shows the directions of the inlet nozzle 110 and the outlet nozzle 120 in the cross-sectional view of FIG. [4] 4A. The directions of the inlet nozzle 110 and the outlet nozzle 120 are not limited to those shown in FIG. 5A, but may be changed as shown in FIGS. 5B and 5C. Therefore, the directions of the inlet nozzle and the outlet nozzle of the pump can freely be changed to suit the environment where the apparatus is installed, for example.--

Page 32, beginning with line 1, please delete the paragraph and replace with the following text:

--The value of the specific speed causes the following problems in designing hydromodels including impellers. If the specific speed Ns < 70, then the pump efficiency is greatly reduced. This has widely been known in the art [as described in pages 43 through 51, Vol. 27, No. 12, "Turbomachinery"]. Kazunari Matsumoto, Junichi Kurokawa, Jun Matsui, and Hiroshi Imamura, *Performance and Effect of Parameters on Very Low Specific Speed Pump*, TURBOMACHINERY, Dec. 1999, Vol. 27, No. 12, pp. 43-51. According to the ordinary impeller designing process, the diameter (the diameter of the outlet of an impeller) is about 110 through about 130 (mm), and the width of vanes (the width at the outlet of an impeller) is about 1 through about 2 mm, so that it is difficult to manufacture impellers according to a casting process and clogs tend to happen in the pump when the pump draws foreign matters.--

IN THE CLAIMS

The claims have been amended as follows:

1. (Amended) A motor frame [characterized in that] comprising:

a first cylinder housing a motor stator therein[,];

a second cylinder disposed around said first cylinder with a space defined between said first cylinder and said second cylinder for a handled fluid to flow therethrough[,]; and

a seat disposed on an outer circumferential surface of said second cylinder for installing a frequency converter thereon,

wherein said first cylinder, said second cylinder, and said seat are integrally formed of one metal material.

5. (Amended) A motor frame according to any one of claims 1 through [4] 3, characterized in that an axial end of the motor frame and a component attached to said axial end are held in direct contact with each other.

6. (Amended) A motor [characterized by] comprising:

a motor frame according to any one of claims 1 through [5] 3;

a motor stator housed in said first cylinder of said motor frame;

a motor frame side plate closing an open end of said motor frame; and

a motor rotor disposed inside of said motor stator and rotatably supported by a bearing provided in said motor frame.

10. (Amended) A motor frame housing a motor stator therein [characterized in that] wherein the motor frame is formed of non-austenitic cast stainless steel.

11. (Amended) A motor frame [characterized in that] comprising:

the motor frame comprises a first cylinder housing a motor stator therein; and

a second cylinder disposed around said first cylinder with a space defined between said first cylinder and said second cylinder for a handled fluid to flow therethrough[;] , and said first cylinder and said second cylinder [are] being formed of non-austenitic cast stainless steel.

15. (Amended) A motor frame [according to any one of claims 10 through 14, characterized in that said non-austenitic cast stainless steel comprises] housing a motor stator therein, wherein said motor frame is formed of martensitic stainless steel containing 15 - 17 % of chromium, 0.5 - 2 % of molybdenum, 4 - 6 % of nickel, and 0.05 % or less of carbon.

16. (Amended) A motor frame [according to any one of claims 10 through 14, characterized in that said non-austenitic cast stainless steel comprises] housing a motor stator therein, wherein said motor frame is formed of ferritic stainless steel containing 20 - 30 % of chromium and 0.5 - 4 % of molybdenum.

19. (Amended) A motor according to claim 17 [or 18], characterized in that said motor comprises a submerged motor having a hermetically sealed structure in said motor frame.

20. (Amended) A motor pump [characterized by] comprising:

a motor according to [any one of claims 17 through 19] claim 17;

an impeller fixed to a main shaft of said motor rotor; and

a pump casing housing said motor and said impeller therein.

21. (Amended) A multistage motor pump [characterized by] comprising:

a motor frame housing a motor stator and providing a passage for a handled liquid around said motor stator;

first fixing portions provided at an axial end of said motor frame and angularly spaced at a predetermined angle;

a first nozzle casing mounted on [an axial end of said motor frame at a variable angle as viewed in an axial direction] said first fixing portions and having a first nozzle directed perpendicular to an axial direction of said motor frame;

second fixing portions provided at an opposite axial end of said motor frame and angularly spaced at a predetermined angle;

a second nozzle casing mounted on [an opposite axial end of said motor frame at a variable angle as viewed in the axial direction] said second fixing portions and having a second nozzle directed perpendicular to the axial direction of said motor frame; and

at least one impeller housed in each of said first nozzle casing and said second nozzle casing.

22. (Amended) A multistage motor pump [characterized by] comprising:

a motor providing a passage for a handled liquid around a motor stator;

first fixing portions provided at an axial end of said motor and angularly spaced at a predetermined angle;

a first nozzle casing mounted on [an axial end of said motor at a variable angle as viewed in an axial direction] said first fixing portions and having a first nozzle directed perpendicular to an axial direction of said motor;

a first impeller disposed in said first nozzle casing for guiding said handled liquid to said passage around said motor stator[,];

second fixing portions provided at an opposite axial end of said motor and angularly spaced at a predetermined angle;

a second nozzle casing mounted on [an opposite axial end of said motor at a variable angle as viewed in the axial direction] said second fixing portions and having a second nozzle directed perpendicular to the axial direction of said motor; and

a second impeller disposed in the second nozzle casing for guiding said handled liquid from said passage around said motor stator, said first impeller and said second impeller having respective inlet ports directed opposite to each other.